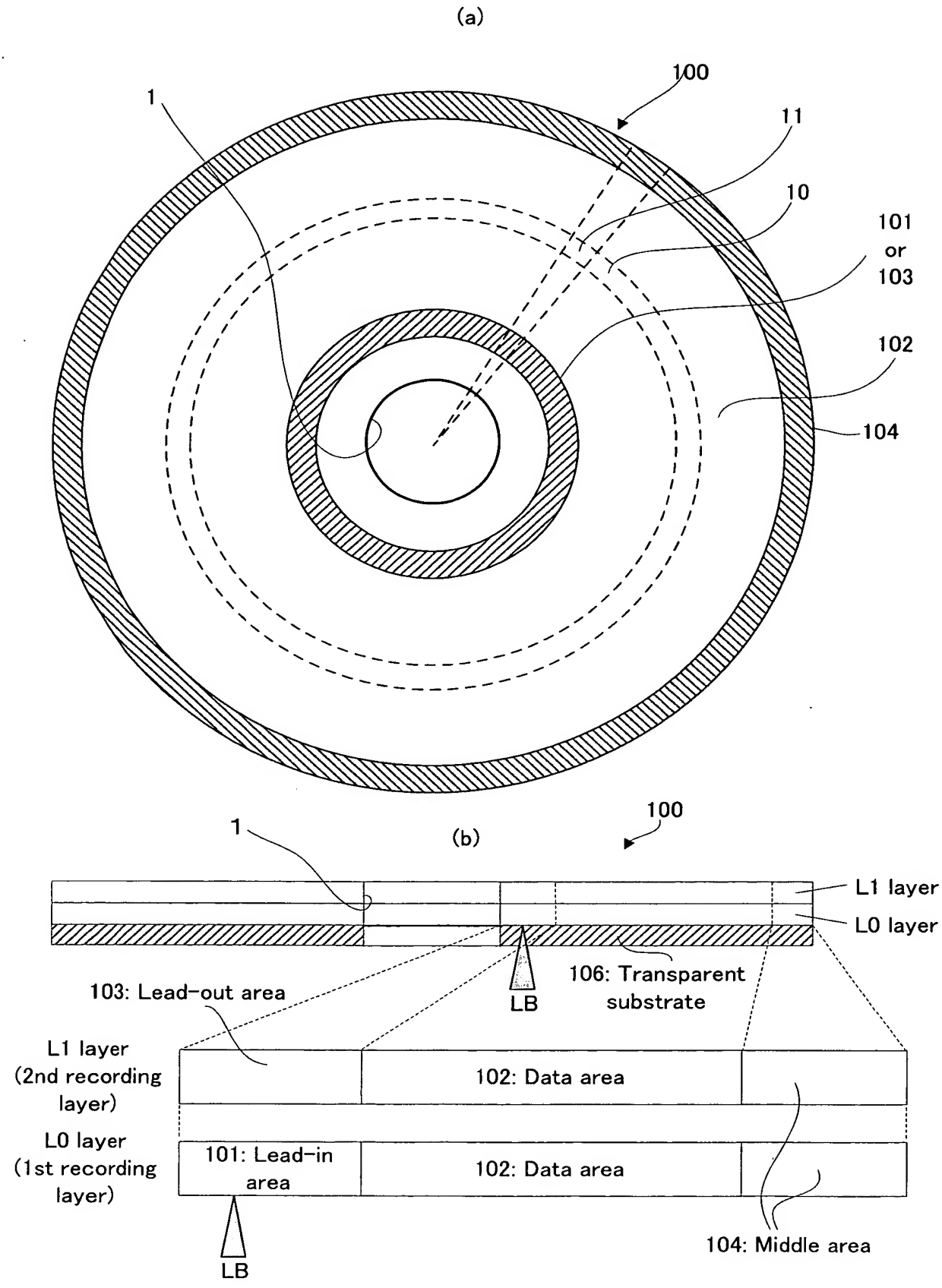
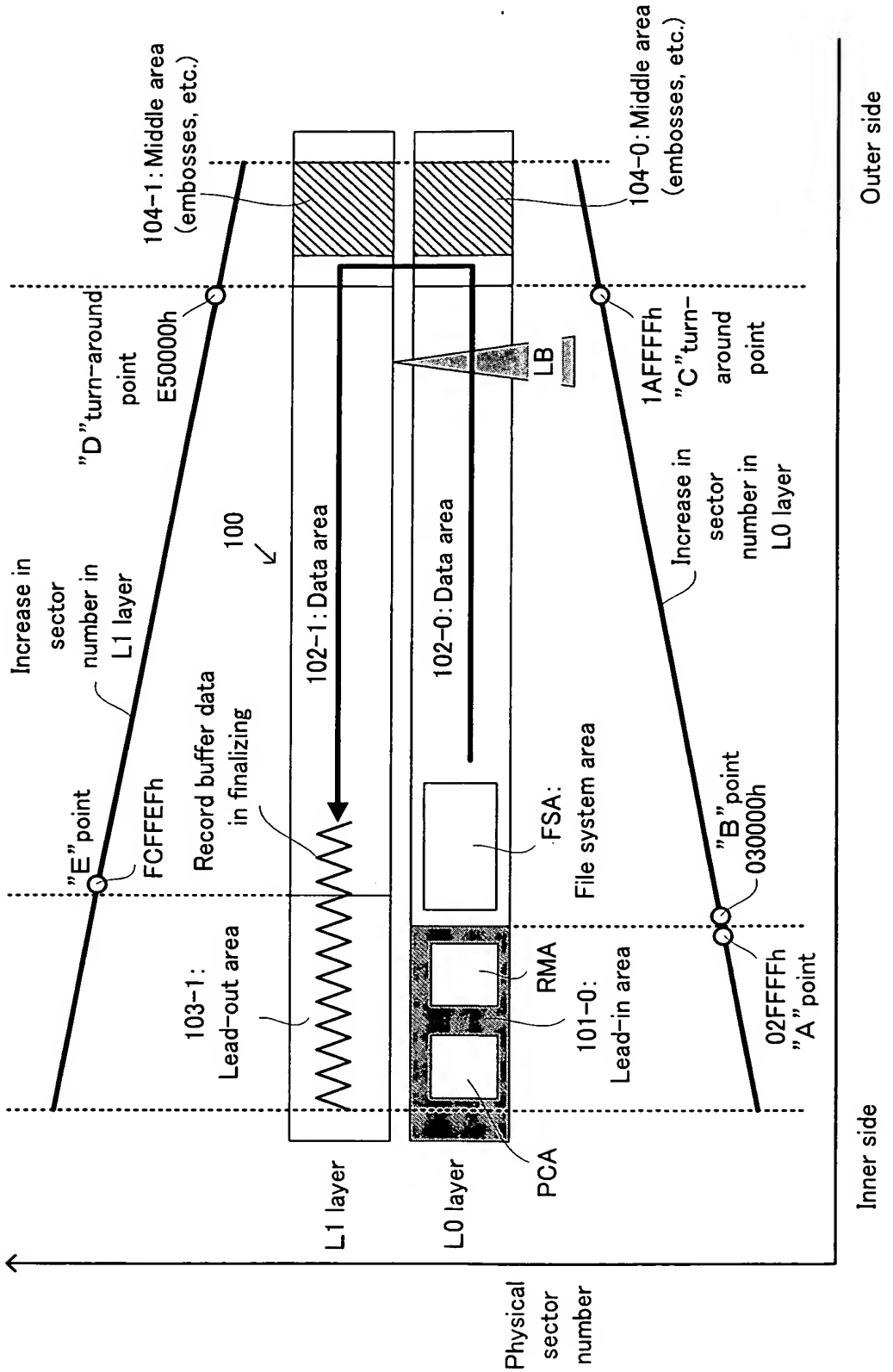
[FIG. 1]


(a)
100
1
11
10
101
or
103
102
104
(b)
100
1
L1 layer
L0 layer
106: Transparent substrate
LB
103: Lead-out area
L1 layer (2nd recording layer)
L0 layer (1st recording layer)
102: Data area
101: Lead-in area
102: Data area
LB
104: Middle area

[FIG. 2]


104-1: Middle area (embosses, etc.)
104-0: Middle area (embosses, etc.)
Outer side
"D" turn-around point E50000h
1AFFFFh "C" turn-around point
LB
Increase in sector number in L1 layer
100
Increase in sector number in L0 layer
102-1: Data area
102-0: Data area
Record buffer data in finalizing
"E" point FCFFEFh
FSA: File system area
"B" point 030000h
103-1: Lead-out area
RMA
101-0: Lead-in area
02FFFFh "A" point
PCA
L1 layer
L0 layer
Inner side
Physical sector number

[FIG. 3]

(for L0 layer+L1 layer)

Field ID	Contents	Location
ID 0	ECC block address	All recording areas
ID 1	Start·End addresses of middle area／extended information, etc.	Lead-in area
ID 2	Strategy information for 1x for L1 layer	Lead-in area
ID 3	Manufacturer's identification number	Lead-in area
ID 4	Manufacturer's identification number	Lead-in area
ID 5	Strategy information for 1x for L1 layer	Lead-in area
ID 6	Other	Lead-in area
ID 7	Strategy information for 1x for L0 layer	Lead-in area
ID 8	Manufacturer's identification number	Lead-in area
ID 9	Manufacturer's identification number	Lead-in area
ID 10	Strategy information for 1x for L0 layer	Lead-in area
ID 11	Strategy information for 2x for L0 layer	Lead-in area
ID 12	Strategy information for 2x for L0 layer	Lead-in area
ID 13	Strategy information for 4x for L0 layer	Lead-in area
ID 14	Strategy information for 4x for L0 layer	Lead-in area
ID 15	Strategy information for 4x for L0 layer	Lead-in area
ID 16	Strategy information for 4x for L0 layer	Lead-in area
ID 17	Strategy information for 4x for L0 layer	Lead-in area
ID 18	Strategy information for 4x for L0 layer	Lead-in area

[FIG. 4]

(L0 layer+L1 layer)

Field ID	Location	ECC block address
ID1	Lead-in area start position	FF DD05h
ID2		
ID3		
ID4		
ID5		:
ID6		:
ID7		:
ID8		:
:	:	:
:	:	
ID17	:	
ID18		
ID1		
ID2		
:		
ID17		
ID18		
ID0		FF D003h
ID0		FF D002h
ID0		FF D001h
ID0	Lead-in area end position	FF D000h
ID0		FF CFFFh

[FIG. 5]

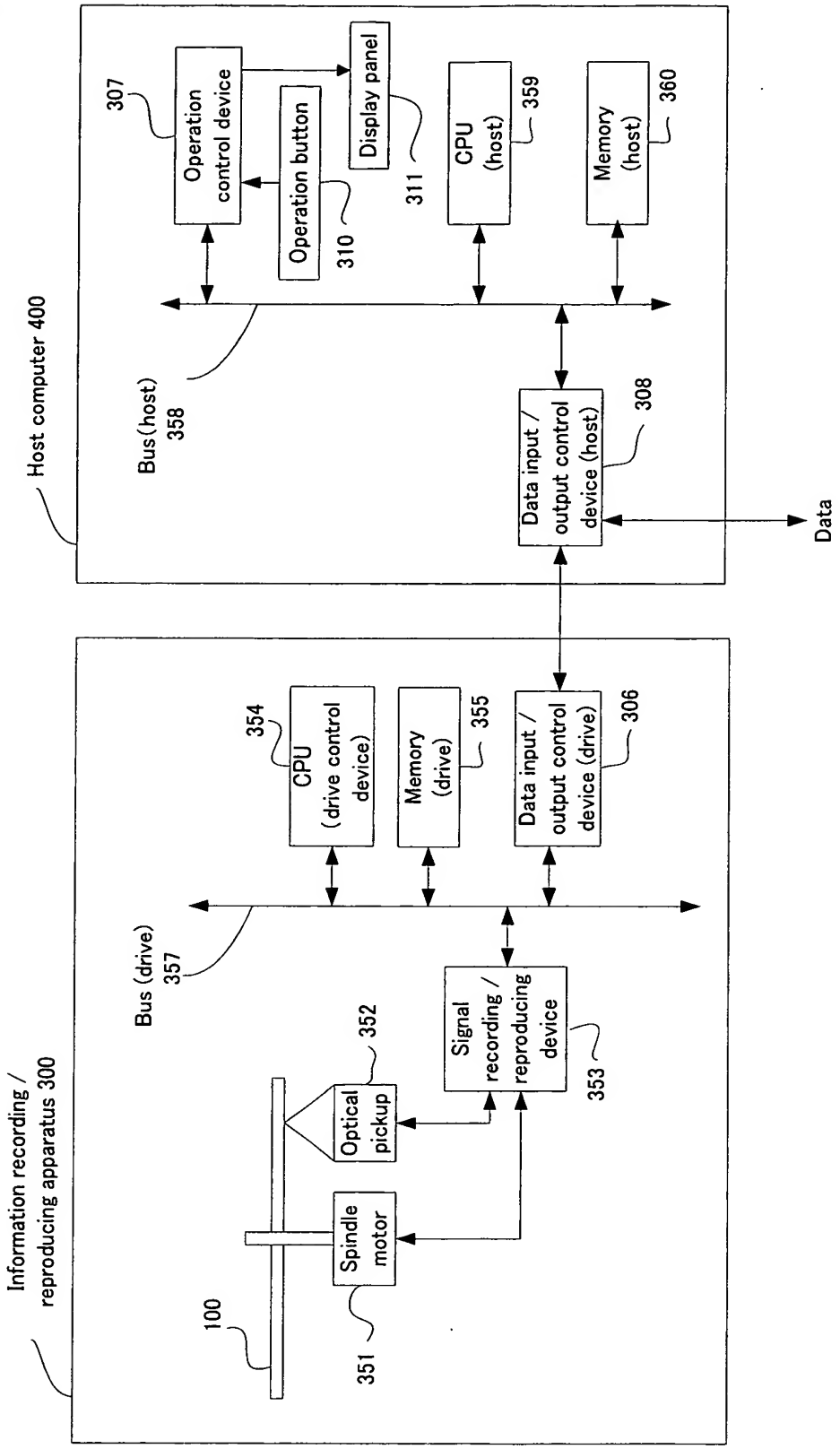
(Field ID#1)

Bit Position		
SYNC'	Data type	Data
0	1to4	5 to 12
0	0000	ECC block address
0	0001	ECC block address
0	0010	ECC block address
0	0011	Parity
0	0100	Parity
0	0101	Parity
0	0110	Other
0	0111	Other
0	1000	Other
0	1001	Start•end addresses of middle area
0	1010	Start•end addresses of middle area
0	1011	Start•end addresses of middle area
0	1100	Other / Extended information
0	1101	Parity
0	1110	Parity
0	1111	Parity

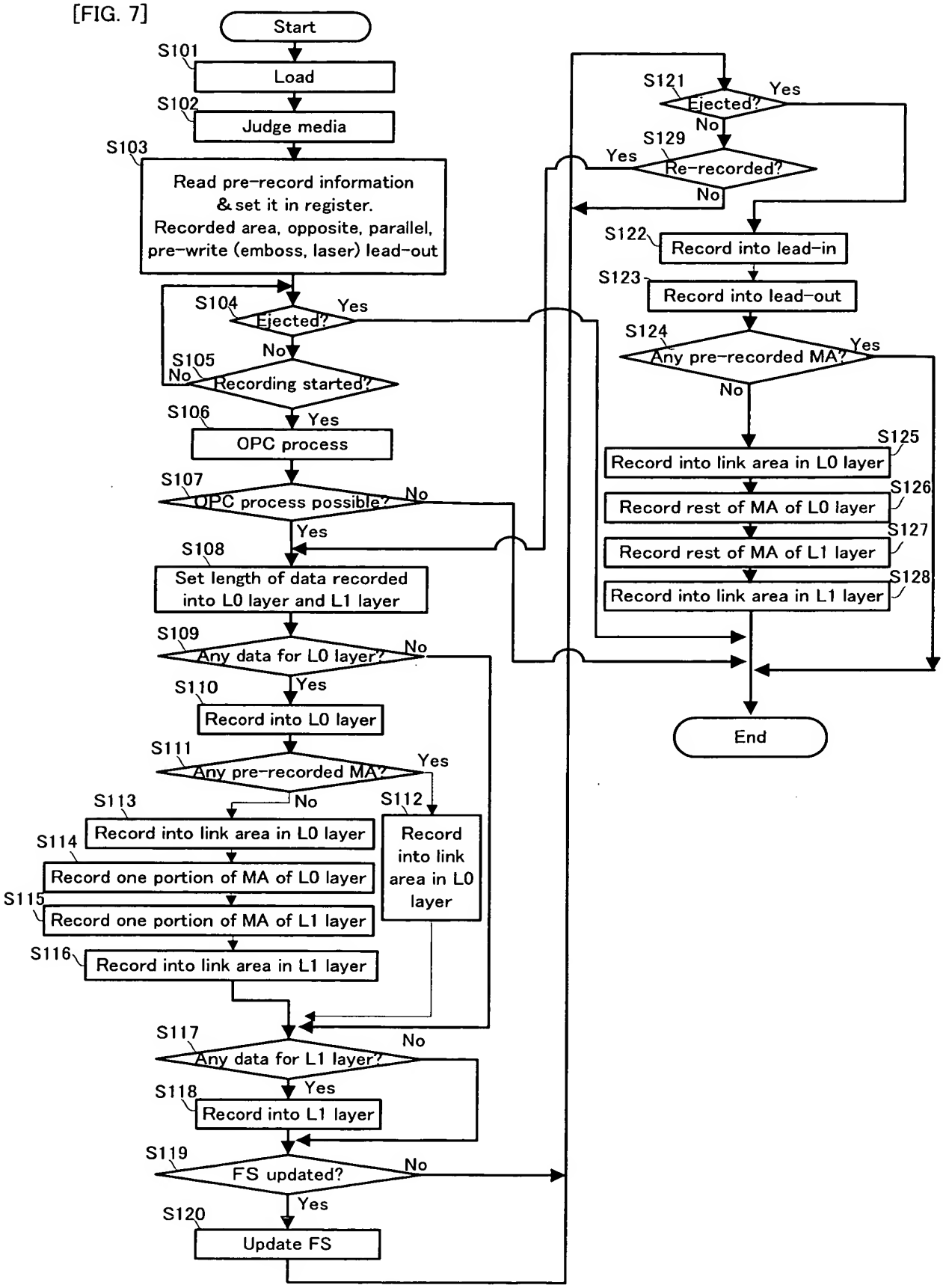
Extended information

Code	Maximum field identification number	
0001	Maximum number of Field ID is 5	→ for L1 layer
0010	Maximum number of Field ID is 13	→ for L0 layer
0011	Maximum number of Field ID is 18	→ for L0 layer + for L1 layer

[FIG. 6]

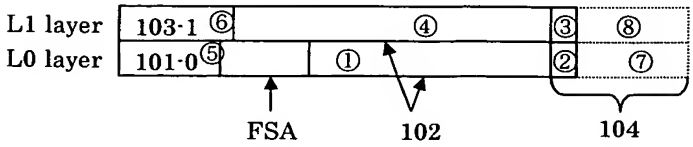

Host computer 400
Operation control device
307
Operation button
310
Display panel
311
CPU (host)
359
Memory (host)
360
Bus (host) 358
Data input / output control device (host)
308
Data
Information recording / reproducing apparatus 300
CPU (drive control device)
354
Memory (drive)
355
Data input / output control device (drive)
306
Bus (drive) 357
Signal recording / reproducing device
353
Optical pickup
352
Spindle motor
351
100

[FIG. 7]

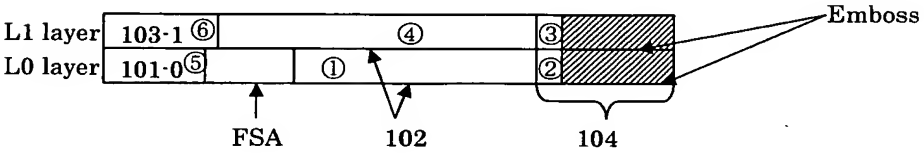

Start
S101
Load
S102
Judge media
S103
Read pre-record information & set it in register. Recorded area, opposite, parallel, pre-write (emboss, laser) lead-out
S104
Ejected?
Yes
No
S105
Recording started?
No
Yes
S106
OPC process
S107
OPC process possible?
No
Yes
S108
Set length of data recorded into L0 layer and L1 layer
S109
Any data for L0 layer?
No
Yes
S110
Record into L0 layer
S111
Any pre-recorded MA?
Yes
No
S112
Record into link area in L0 layer
S113
Record into link area in L0 layer
S114
Record one portion of MA of L0 layer
S115
Record one portion of MA of L1 layer
S116
Record into link area in L1 layer
S117
Any data for L1 layer?
No
Yes
S118
Record into L1 layer
S119
FS updated?
No
Yes
S120
Update FS
S121
Ejected?
Yes
No
S129
Re-recorded?
Yes
No
S122
Record into lead-in
S123
Record into lead-out
S124
Any pre-recorded MA?
Yes
No
S125
Record into link area in L0 layer
S126
Record rest of MA of L0 layer
S127
Record rest of MA of L1 layer
S128
Record into link area in L1 layer
End

[FIG.8]

(a)

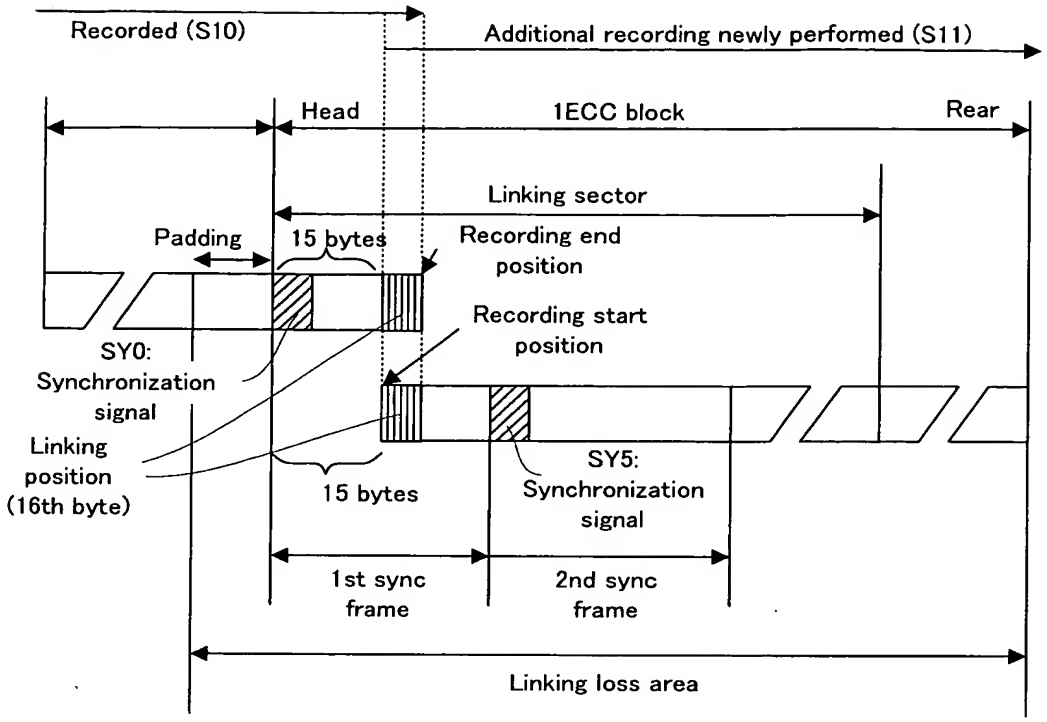

L1 layer
L0 layer
103-1 ⑥
101-0 ⑤
④
①
③ ⑧
② ⑦
FSA
102
104

(b)

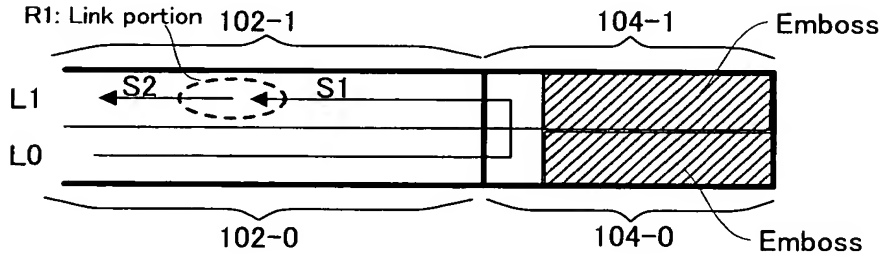

L1 layer
L0 layer
103-1 ⑥
101-0 ⑤
④
①
③
②
Emboss
FSA
102
104

[FIG. 9]

(a)

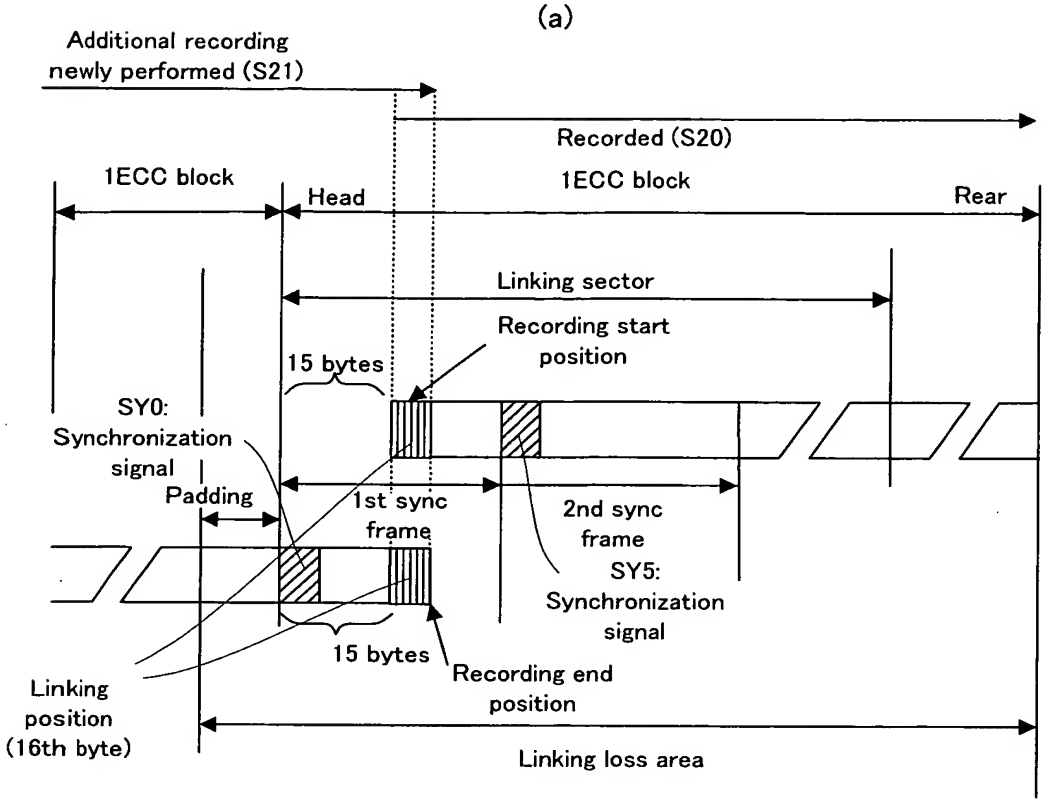

Recorded (S10)
Additional recording newly performed (S11)
Head
1ECC block
Rear
Linking sector
Padding
15 bytes
Recording end position
Recording start position
SY0: Synchronization signal
Linking position (16th byte)
15 bytes
SY5: Synchronization signal
1st sync frame
2nd sync frame
Linking loss area

(b)

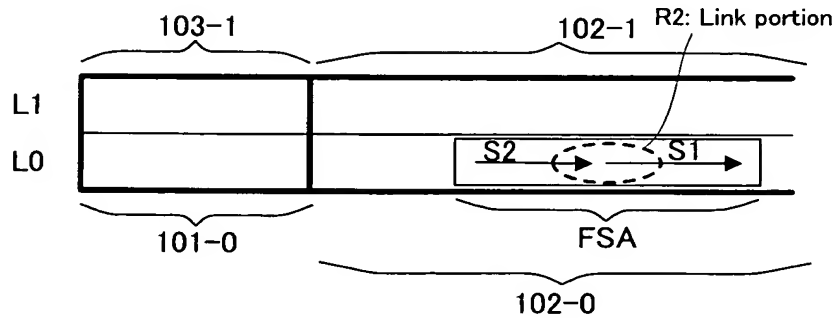

R1: Link portion
102-1
104-1
Emboss
L1
L0
S2
S1
102-0
104-0
Emboss

[FIG. 10]

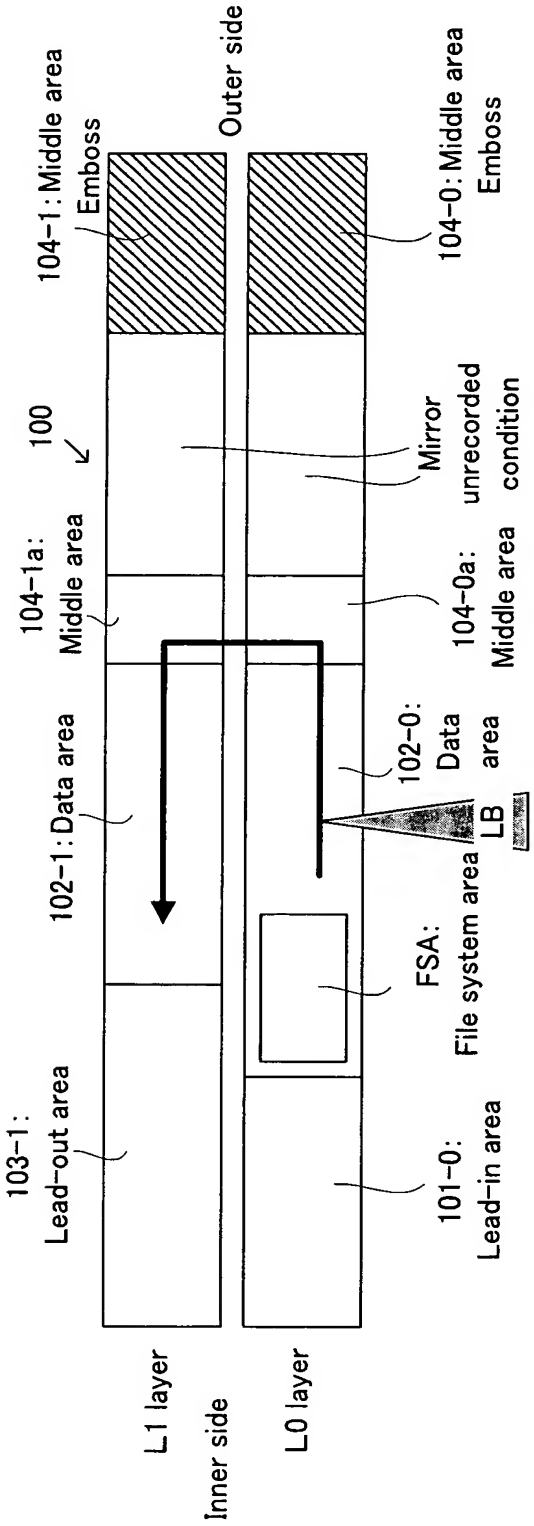
(a)


Additional recording
newly performed (S21)
Recorded (S20)
1ECC block
Head
1ECC block
Rear
Linking sector
Recording start
position
15 bytes
SY0:
Synchronization
signal
Padding
1st sync
frame
2nd sync
frame
SY5:
Synchronization
signal
15 bytes
Recording end
position
Linking
position
(16th byte)
Linking loss area

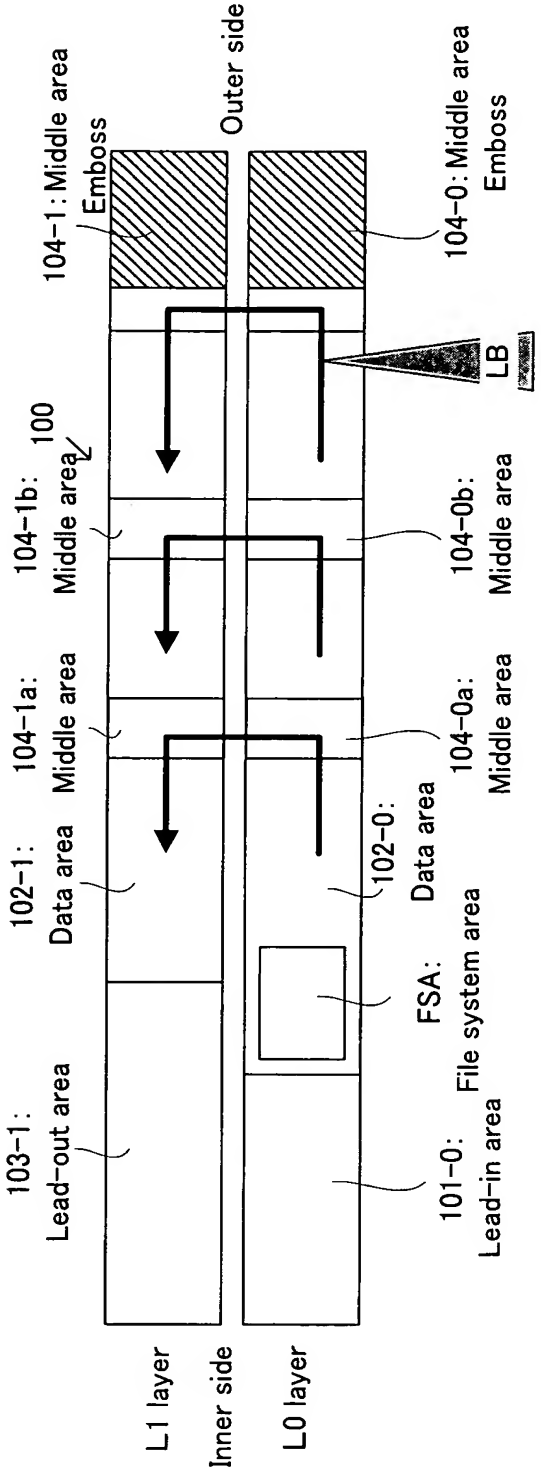
(b)


103-1
102-1
R2: Link portion
L1
L0
S2
S1
101-0
FSA
102-0

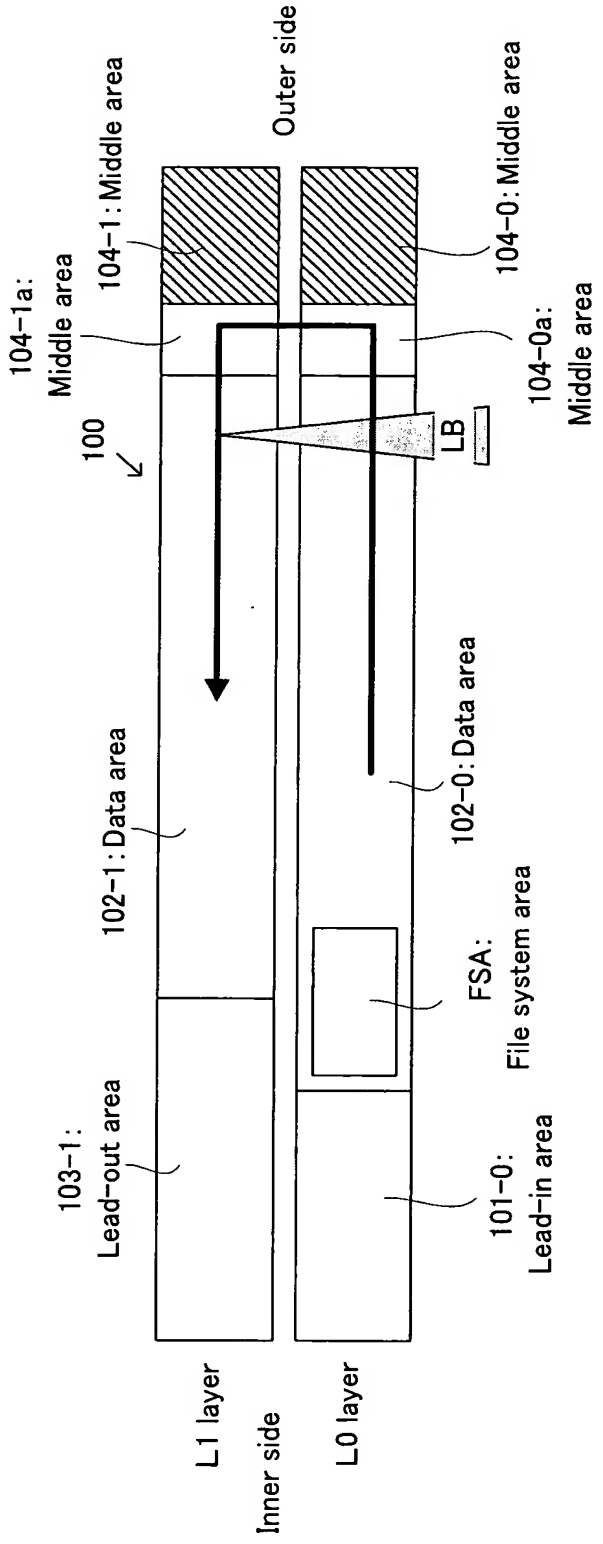
[FIG. 11]


Outer side
104-1: Middle area
Emboss
104-0: Middle area
Emboss
100
Mirror
unrecorded
condition
104-1a:
Middle area
104-0a:
Middle area
102-1: Data area
102-0:
Data
area
LB
FSA:
File system area
103-1:
Lead-out area
101-0:
Lead-in area
L1 layer
Inner side
L0 layer

[FIG. 12]


Outer side
104-1: Middle area
Emboss
104-0: Middle area
Emboss
LB
100
104-1b: Middle area
104-0b: Middle area
104-1a: Middle area
104-0a: Middle area
102-1: Data area
102-0: Data area
FSA: File system area
103-1: Lead-out area
101-0: Lead-in area
L1 layer
Inner side
L0 layer

[FIG. 13]


Outer side
104-1: Middle area
104-0: Middle area
104-1a: Middle area
104-0a: Middle area
100
LB
102-1: Data area
102-0: Data area
FSA: File system area
103-1: Lead-out area
101-0: Lead-in area
L1 layer
L0 layer
Inner side